

Hobbies

WEEKLY

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How the amateur handyman can make a TRAILER CARAVAN

THERE are many ways of making a trailer caravan and there are several things which decide the way in which it shall be made. First there is the matter of how much cash is to be spent. Then there is the question of total weight. Thirdly, there is how much accommodation will be needed.

This article describes the making of a simple two-berth camping trailer which can be towed up hill and down dale by

any popular 8 h.p. car. The usefulness of this trailer can, of course, be increased by making use of a small tent, thus providing accommodation for two adults and two children.

Chassis Obtainable

The details from which these notes were written, were collected a few years ago when the writer made a similar caravan, using materials purchased chiefly from the car breakers;

new materials being then unobtainable. It is now possible to obtain all the required materials, including aluminium sheeting, ash bends, canvas, plywood, or/and compressed board, metal mouldings and channel iron. The Editor can, if necessary, put you in touch with a firm supplying the chassis.

Firms who specialize in caravan equipment offer comprehensive lists of these materials and in addition, fittings for windows, doors, wheels, ball hitches

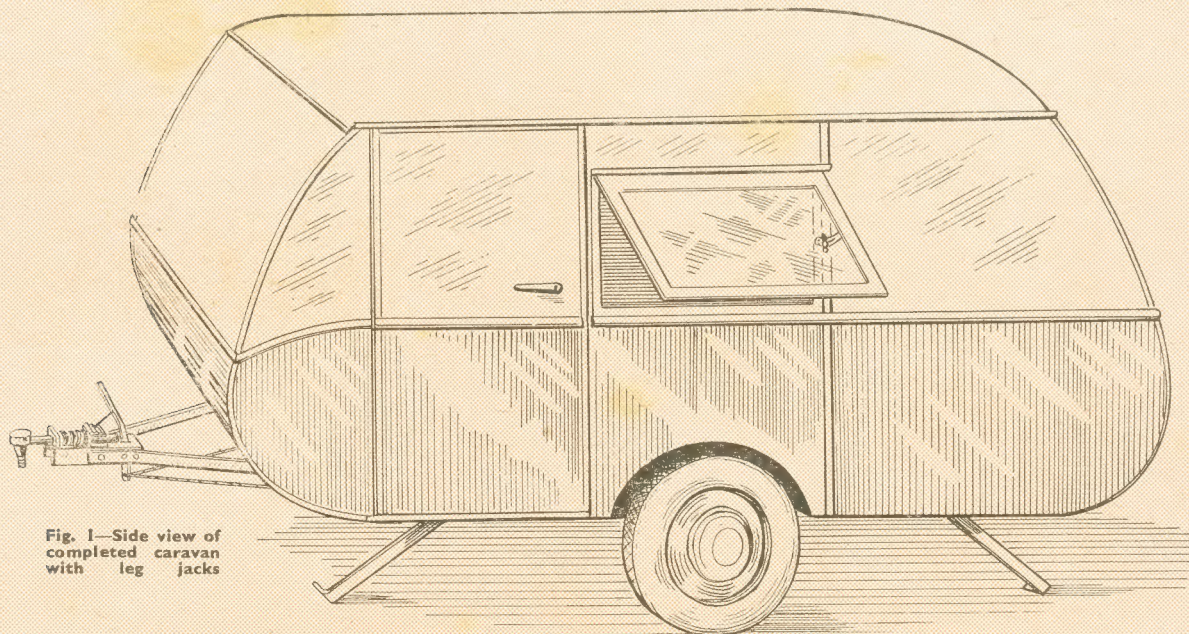


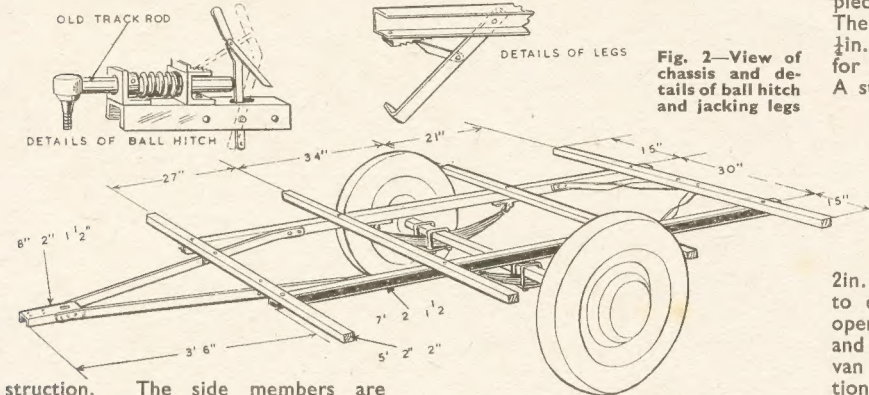
Fig. 1—Side view of completed caravan with leg jacks

and interior fittings. However, how much is bought, and how much is made, will depend, as already mentioned, on the available cash, and—we might include—the time limit, the facilities, and the skill of the reader.

The construction details need not be strictly adhered to, as the information is given as the basic conception into which the reader can introduce his own ideas according to the facilities and materials to hand.

The Chassis

The chassis is of very simple con-



struction. The side members are channel iron 2ins. by 1 1/2ins., to which are bolted four 5ft. lengths of hardwood, preferably ash. Two braces of 1 1/2ins. by 1/2in. flat iron are fitted to the rear, being bolted to the sides and the rear cross member with 1/2in. bolts. The front of the chassis is braced by taking the two sides of the tow bar from just in front of the wheel springs, where they are bolted to the side members, and secured to the front cross member.

These can be made of 1 1/2in. angle iron or 1 1/2in. by 1/2in. flat iron. To the front end of these two pieces is bolted a length of 2in. by 1 1/2in. channel iron approximately 8ins. long, suitably drilled for the ball hitch, and drilled and slotted for the brake lever.

If it is decided to make the body detachable from the chassis, a length of 1 1/2in. angle iron should be bolted across and under the front and rear of the side members. The four wooden cross members can then be counted as part of the body and they need not be bolted to the chassis until after the body has been built on to them.

When the intermediate cross members are spaced out, it should be borne in mind that the wheels are fitted slightly to the rear of the chassis in order to throw the weight to the front and make for easy riding. Also the ash bends for the wheel arches are usually listed at 16ins. inside radius.

Making the Jacks

Four legs or jacks will be needed and there are many ways of making these. Pieces of 2in. by 2in. timber hinged to the side members complete with some form of adjustment for uneven ground, would serve quite well. Flat iron 1 1/2ins. by 3/8in. fitted up as shown would be better.

This scheme could be improved upon following the lines of those on the market, although for such a light vehicle, anything elaborate is unnecessary and would only add to the weight and cost. Whichever way they are made, some form of clip must be fitted to hold them in the up position. This can be arranged by using flat spring steel bent to form a clip and bolted under the side members.

Wheels and Axle

Special axles complete with wheels are listed in the catalogues, but these are

generally expensive (£25 to £30), so if one has the facilities for making a set up, a great saving in cost can be made. Quite good axles complete with wheels can sometimes be purchased from the car breakers, being either a light car front or rear axle.

If a car rear axle is used it should be lightened as much as possible and the brakes should be overhauled. When using a front axle, the stubs will have to be fixed to prevent the wheels steering. This can be done by bolting suitable

if one is in the engineering business, a simple arrangement can be made as illustrated. The car breaker is again visited, this time for a lorry type track rod of 1in. to 1 1/4ins. diameter and complete with ball end. The rod is sawn off to a suitable length (approximately 8ins.). A 2in. length of 2in. by 2in. angle iron and a 2in. length of 2in. by 2in. channel iron are then drilled to take the track rod and for the fixing bolts.

The track rod is fitted with a shafting collar and both are drilled to take a 1/2in. bolt. The piece of channel iron is fitted with a brake rack consisting of a piece of grooved steel welded in position. The brake lever is made from 3/4in. by 1/2in. flat steel. This is fitted with a sprag for holding the brake on when parking. A stout spring is used to take up the shock at override, the assembly being built up as shown.

Body Framework

The body framework is constructed chiefly of 1 1/2in. by 1in. ash, with 2ins. by 1in. for the door jambs. These are fitted with the 2in. sides to the front and rear in order to eliminate spring when the door is opened and closed. Additional stringers and down posts can be fitted if the caravan is to be used under arduous conditions. The framework illustrated is suitable for general conditions and the frame can be made stronger by fitting corner strengthening pieces at every convenient point. These can be made of either wood or metal.

The size of the body shown has an overall length of approximately 9ft., the front and rear ash bends being about 18ins. deep. The width is approximately 5ft. The body can, of course, be made larger within the scope of the chassis.

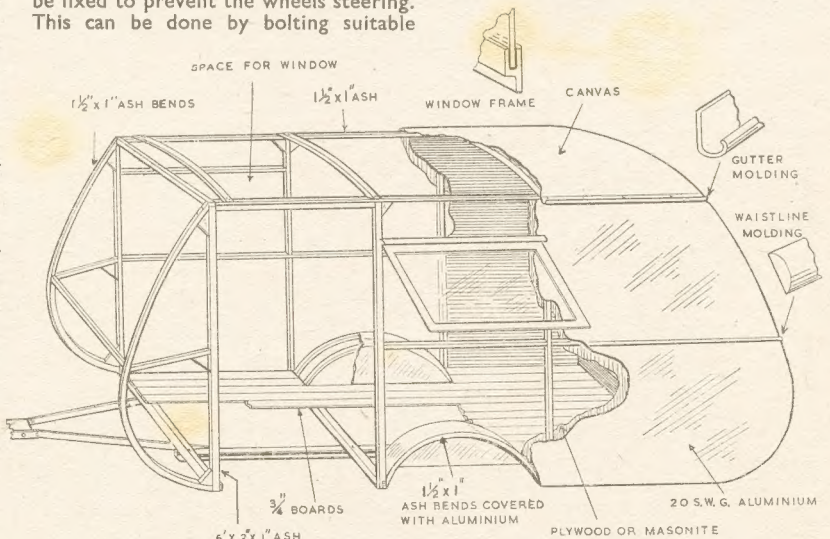


Fig. 3—Showing construction of framework and broken view of metal and outside covering

plates each side of the axle contacting each wheel hub.

The Ball Hitch

Ball hitches, complete with brake levers, can be bought for about £4, but

The size shown allows for 6ft. by 3ft. to 4ft. bunk space (with the second bunk in position), 5ft. by 15ins. cupboard space at the front, and about 5ft. by 20ins. for the cooking equipment and cooking space.

(To be Continued)

A useful piece of carpentry to undertake is this FIRE-PLACE SCREEN

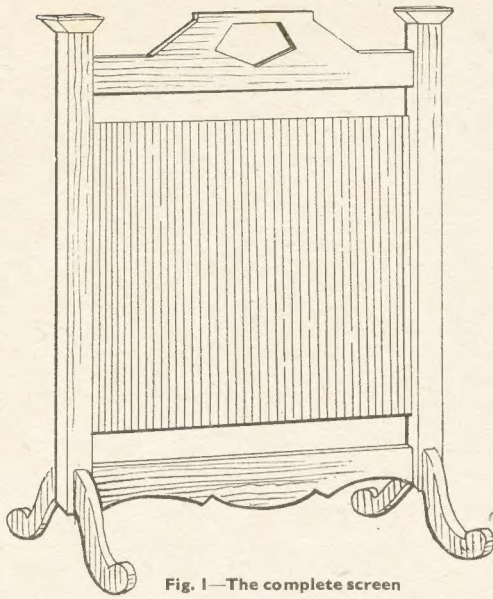


Fig. 1—The complete screen

WE illustrate in Fig. 1 an artistic fire-place screen of good proportions and dimensions to suit almost any hearth and fireplace. This is just the sort of job for the home craftsman who has command of his tools and can work up simple mortise and tenon joints and do ordinary plain carpentry.

The screen consists of a simple frame of some such wood as mahogany, beech or oak and fitted with shaped feet so it stands firmly in the hearth in an upright position. Now, the filling of the centre part of the frame may be carried out in one or two ways.

First, it may, perhaps, be fitted with a plywood panel upon which some mitred pieces of beading or moulding may be fixed. The beading should be pre-designed to form a pleasing panel pattern, with the centre filled with an overlay of raised wood carried out in some contrasting colour stain.

Secondly, the opening of the frame could be filled with a folk-weave fabric held top and bottom by cross pieces of turned rod, as shown in the details here. A wool-work panel upon a suitable backing fabric would also look well and show off to perfection the skill of one or more of the female of the family.

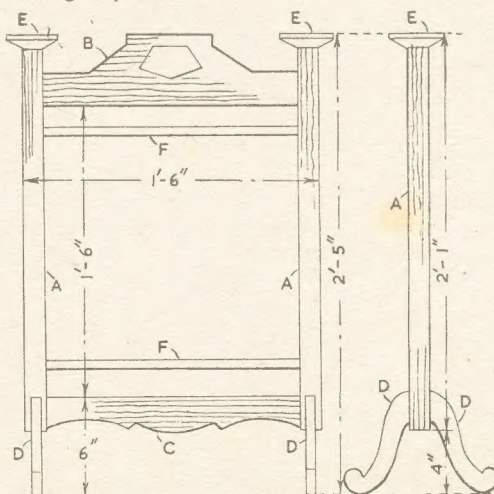


Fig. 2—Front view showing all parts

Fig. 3—Side view

At Fig. 2 we see the front view of the frame or stand, giving the main dimensions to which the various rails, etc., are to be cut. The main uprights (A) of the frame may be 1in. square in section, and the cross rails (B) and (C) framed with mortise and tenon joints into them. In the enlarged detail (Fig. 7) the actual mortises and tenons are shown of both rails, drawn apart to simplify the constructional working.

The tenons should be cut the full depth of the rails— $\frac{1}{2}$ in. long by $\frac{1}{8}$ in. wide. The mortises in the uprights must be carefully marked out and cut to fit the tenons. The shaped legs (D) which are framed into the lower ends of the uprights should next be prepared and glued in firmly.

The Legs

The pattern for the legs is shown in Fig. 6. The lines which are ruled across this illustration are represented to be 1in. apart. Some care should be taken in preparing the full-size pattern for these legs, and it will be a good plan to make up a thin wooden pattern or template first, from which all four legs can be afterwards marked.

Note how the tenon will be set out at the top end of the leg. Each tenon should be $\frac{1}{2}$ in. wide and $\frac{3}{8}$ in. deep to meet in the centre of the uprights (A). The detail, Fig. 7, shows the leg tenon ready to be inserted into its mortise.

In marking out the legs care should be taken to see the grain of the wood runs with the shape of the legs as far as possible; note this on detail Fig. 6. A useful

cross section showing how the rail (C) and the legs (D) meet in the centre of the upright (A) is given in Fig. 8.

Figs. 4, 5 and 6 simply show the patterns for the shaped parts of the cross rails and legs. Allowance must be also made for the extending tenons at the ends. It should be explained that the top rail (B) is $4\frac{1}{2}$ ins. wide at the centre, and that rail (C) is 2ins. wide.

The work having been thus far carried out, the parts of the screen which have been framed up should be cleaned and fitted together temporarily. It will be necessary to cut small tenons—called 'stub tenons', which should be $\frac{1}{4}$ in. long at the top ends of uprights (A) for fixing on the shaped wood caps (E). Four holes must be bored also in the inside faces of the uprights to take the ends of the turned wood rods as (F) in Fig. 7 and in Fig. 2.

Fig. 3 shows an end view of the stand and shows that the above rods do not project through the uprights (A). The holes may be $\frac{1}{2}$ in. or $\frac{3}{8}$ in. diameter to suit the section of turned rod used. The holes may be bored to a depth of $\frac{1}{2}$ in. or $\frac{3}{8}$ in. The work may now be finally glued up and held where possible by clamps until the glue has hardened. It will be a good plan to fix the legs into the uprights first, after which the cross rails are fixed.

The wooden caps (E) should next be prepared and glued firmly to the top of the uprights. Each cap is 3ins. square by $\frac{1}{2}$ in. thick, the underside edges being chamfered or otherwise shaped.

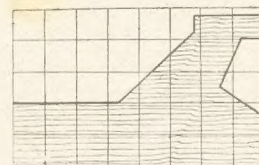


Fig. 4—Half shape of top



Fig. 5—Lower rail shape

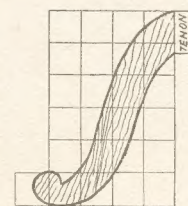


Fig. 6—Outline of feet

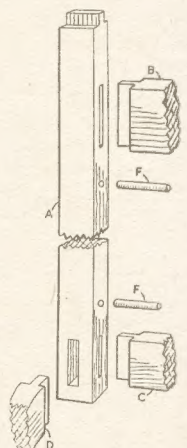


Fig. 7—Post and rails

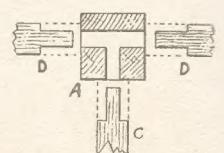
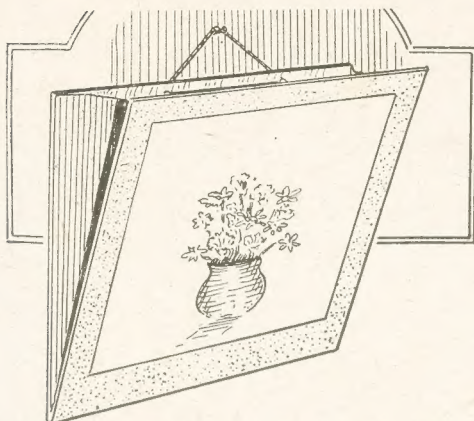


Fig. 8—How parts fit

A useful holder for bills, letters, notes, etc., is found in this HANGING POCKET



FOR a change from woodwork and model making, the useful little article illustrated might find favour. It is made to hang from the wall, and hold odd letters, papers, what you will that is light. A general handy article to help keep the home tidy.

For material, all that is required are one of those artistic almanacs of last year's date, a cardboard box from the grocer and a small piece of strong linen or lining material. Not an expensive collection. Should it happen that no suitable almanac is available, then plain cardboard can be substituted, and decoration supplied with a coloured picture or other means, depending on the artistic ability of the reader.

Picture Decoration

Most homes can, however, find the almanac, and so make good use of a pretty picture which is too often thrown away through lack of not knowing any use to put it too.

Fig. 1 shows a suggested size, the dimensions being given only when no almanac is available. Otherwise the dimensions of Fig. 1 should be the same as those of the almanac to be made use of. Cut two of Fig. 1 and cut, from plain or

coloured paper, two to the same size, plus 1in. extra at sides and top, as indicated by the dotted lines.

Snip these at the top corners, paste them, and rub well down to the cardboard. Turn over and press down at the back. See the corners are neatly folded and the whole free from creases.

From the linen or lining material mentioned, cut two gussets to the shape at (A) in Fig. 2. Width at top and bottom are given, the length will be the same width at Fig. 1, or whatever the almanac measures, plus $\frac{1}{2}$ in. at top and

1in. at bottom. The $\frac{1}{2}$ in. at top is folded over and either glued or stitched down.

Now fold and press down 1in. each side, as shown by dotted lines, to crease the material, and so mark it, for these parts are to be glued to the cardboard back and front pieces of the pocket. As

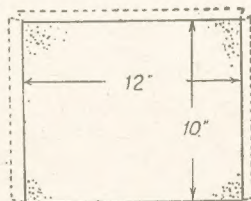


Fig. 1—A suggested size

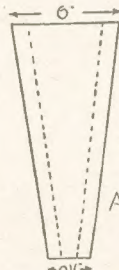


Fig. 2—End flaps

stated they act as gussets, forming the pocket of the paper holder.

Glue one side first, and rub well down to the cardboard. Ordinary glue will serve for the job, freshly made and not too thick. Leave for an hour or so, then fold the gussets inside, place the second piece of cardboard under, and with the whole in position, glue the remaining part of each gusset to the bottom cardboard.

At the bottom the extra 1in. of the gussets will stick out, cut off one half and glue the other half over the joint. Between the gussets glue a 1in. wide strip of the material along to finish joining the halves of the pocket together, at the bottom.

The detail sketch (B) in Fig. 2 will show the foregoing details and make all

clear, though there is nothing really difficult about the job to grasp. The cardboard side of the pocket should now be able to open out, and should be left open for an hour or two to better ensure that they do not stick together. Gluing can be rather a sticky job, not to say a messy one, especially when the stuff gets on the fingers or the glue pot is knocked over.

It is always a good plan to let the glue pot stand in a small saucepan of hot water, a piece of cardboard being placed under the saucepan to protect the table. It is then unlikely to be easily upset. Protect the surface of the table itself with an old newspaper, and after gluing anything, tear the soiled newspaper away and so leave a clean surface for gluing the next part upon. With the above precautions a much less messy job results.

Fitting the Pocket

The pocket, as we can now call it, should be turned over, what will be the back part now uppermost. Cut a sheet of the coloured paper, already used for the inside of the pocket, a shade less than the dimensions of the cardboard,

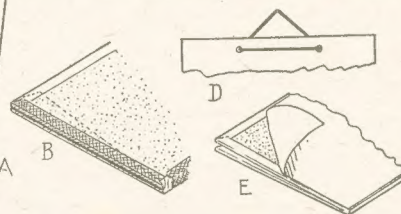


Fig. 3—Hanging and fixing details

and paste this over the back to hide the edges of the gussets and bottom hinge, as seen at (E) Fig. 3.

Now turn right side up, take the almanac, date pad removed, of course, glue about 1in. or a little more round the edges, and stick well down to the cardboard. Place a box, or something flat and rather weighty on top and leave for a few hours for the paste and glue to set.

For Hanging

For suspension purposes, punch two holes in the back of the pocket, about 5ins. apart, or less if the dimensions of the pocket are less than those given in Fig. 1. Through these holes thread a short length of any strong fancy cord that the household can furnish, knot the ends and draw up, as at (D).

A suitable brass-headed nail or cup hook, is better for suspending the pocket than an ordinary nail. Not only does it look neater but holds the pocket more firmly, so that the withdrawal of papers, etc., will not pull the pocket off the wall. Or you can cover the front with a third piece of card, a panel of paper and a picture as shown above.



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BIRMINGHAM

14 Bull Ring

SHEFFIELD

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10 Queen Victoria Street
(Phone 28639)

HULL

10 Paragon Square

SOUTHAMPTON

25 Bernard Street

BRISTOL

30 Narrow Wine Street
(Phone 23744)

Amateur electricians may like to try their hand at A TRIPOLAR MOTOR

AN electric motor with three poles on the armature is a little more difficult to construct than one with only two poles, but has the advantage that it is always self-starting. With a two-pole armature a motor will not start when the current is switched on if the poles are in the dead-centre position, though it will run satisfactorily when the armature is turned from this position.

The motor described here has three poles and will always start itself when current is switched on. The field coil is wound (e.g., not permanent magnet) and consequently the motor will operate from alternative current such as supplied by a small mains transformer. It will also run from dry battery or accumulator.

Making the Armature

The armature has three iron poles spaced at 120 degree intervals round an axle and this part may be made up as shown at (A) in Fig. 1. Each of the poles is a small iron bolt (which may be obtained from an ironmonger's) with the shank sawn off. Dimensions can naturally vary considerably, but it is suggested each pole be $\frac{3}{4}$ in. long. A disc of scrap wood about $1\frac{1}{2}$ ins. in diameter is also cut.

After assuring each of the pole pieces is of the same length and filing to correct any errors, the inner ends of the pieces should be tinned in preparation for soldering to the axle. File the ends and shanks of the pieces bright and smear with soldering flux; afterwards heat with a spirit lamp or large iron until the solder flows freely on to the pole pieces. Treat

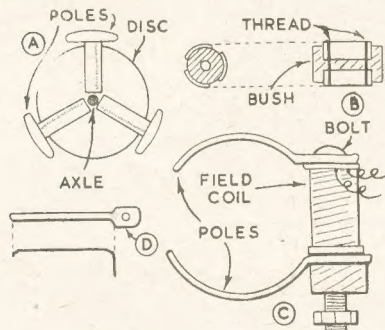


Fig. 1—How the parts are made

the centre of the axle in the same way.

The three poles should now be arranged as shown in Fig. 1, and may be secured to the disc with staples. Also have the axle in position projecting through a hole in the disc and support the whole on blocks so that the axle is vertical.

Plenty of solder should now be applied to the axle and inner ends of the pole pieces and melted on with a large iron which is really hot. When a good

joint has been obtained and the solder has set, the wooden disc is discarded.

The commutator is shown at (B) and consists of three segments of metal on an insulating centre bush. The latter has a central hole which is a tight push fit on the armature axle.

Bushing

The bush may consist of ebonite, wood, or similar material. A long strip of glued paper about $\frac{1}{2}$ in. wide wound tightly round the axle is also suitable. The three metal segments may be bent from thin metal or a short length of brass or copper tubing can be sawn into three to form the sections.

The segments are held in place by binding with varnished thread and then setting aside to dry. A clear space is left between the bindings; here the brushes will run.

The brushes are shown at (D) in Fig. 1. They are cut from thin brass or similar metal and have a small hole so that they can be screwed to the wooden base of the finished motor. Remove any rough edges on brushes or commutator segments with a file. Friction will be reduced if the overall diameter of the commutator is not larger than necessary— $\frac{1}{2}$ in. in diameter is a convenient size.

Making the Field Coil

The completed coil with poles is shown at (C). Actually, the motor will run well if the poles are flat, but it is an advantage to curve them as shown if possible, as this strengthens the magnetic effect between field and armature. Each pole consists of a strip of iron about $\frac{3}{4}$ in. wide and 2 ins. long, secured by a fourth iron bolt as illustrated.

A cardboard washer is placed on the inside of each of the poles to keep the wire which will be wound on away from the metal. For the same reason a layer of insulating tape or thick paper is wound round the bolt.

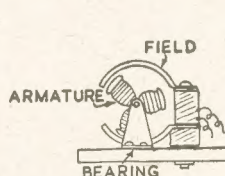


Fig. 2—Side view of motor

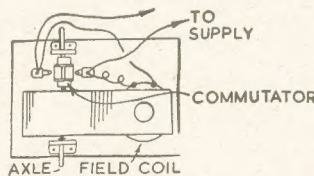


Fig. 3—Top view showing connections

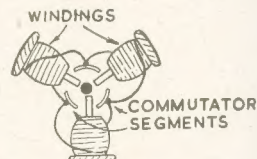


Fig. 4—Armature winding

The armature turns within the poles of the field coil, as shown in Fig. 2. The smaller the gap between armature poles and field poles the better, but, naturally, the poles must not foul each other as the armature rotates.

Bearings cut from fairly stout metal and screwed to the baseboard support the armature axle, and sideways movement is prevented by washers. The field coil is mounted by means of the large iron bolt, a small block being placed

under the lower pole as shown.

It is essential that the armature is wound in the correct manner or one pole may endeavour to cause rotation in the opposite direction to the other two and the motor will only run at low speed and possess little power.

Each pole should be wound in such a way that, looking at it from its free end, all the turns upon it are in the same direction as the turns upon each other pole, when looking at them from their free ends. This is shown in Fig. 4 and no difficulty should arise if the armature is held in one hand and each pole wound in the same direction with the other.

Wiring

The wire should be wound quite tightly, and as many turns as space permits should be put on. Approximately the same number of turns should be used on each pole to avoid vibration. The outside ends of each winding may be secured by raising the wire and passing the end under the previous turn, afterwards pulling tight.

The ends of the windings should be soldered to the commutator segments in the manner shown in Fig. 4. The commutator is a push fit on the axle, but a little free wire should be left so that it can be rotated slightly in relation to the armature poles in order to obtain the best running position.

Field Winding

This consists of one simple coil of wire as shown at (C) in Fig. 1, as many turns as possible being put on. If the wire is wound carefully in layers, maximum efficiency will be obtained.

The ends of this winding are taken to the screws securing the brushes, and the leads to the battery or other source of supply also come from these points, as shown in Fig. 3. If it is desired to reverse the direction in which the finished motor runs, this can be accomplished by

reversing the ends of the field coil.

Double cotton covered wire is best as there is less chance of a short circuit to any metal parts than is so with enamel covered wire. However, the latter is perfectly satisfactory if tape or thick paper is placed between the winding and the armature poles so that the enamel insulation is not scratched off and a short circuit caused.

(Continued foot of page 22)

Prevent the irritating loss of your books by MAKING A BOOK PLATE

YOU have probably allowed people to borrow some of your books, and waited in vain for their return; maybe you have been at fault yourself and forgotten to return borrowed books. But a book will go astray less easily if it contains the owner's book-plate. This consists of a label which is stuck inside the cover of a book, and

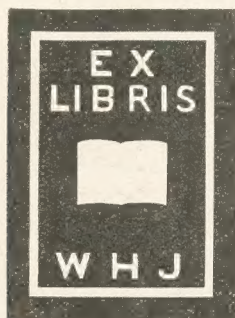


Fig. 1—Cutting the lettering white

contains the Latin words 'Ex Libris', meaning 'from the books of', and the owner's name or initials. Very often some design is incorporated, too, and the initials may be in the form of a monogram.

Wood or Lino Cut

You can supply your books with book-plates printed from a wood or lino block. Cutting the block is fascinating work, and many interesting effects can be obtained. To make a wood block, you need a piece of smooth, close-grained wood, such as cherry, birch or holly. A convenient size is 4ins. by 3ins. and any suitable thickness. The smaller the block, within reason, the better.

Square up the block, smooth the

edges, then plane and glasspaper one face until a perfectly flat surface is obtained. Next, prepare the design that you wish to use. The illustrations show ideas for book-plates which are very effective, though simple to produce. Do not go in for complicated designs for they are difficult to cut, and often print badly.

White on Black

Fig. 1 shows the effect produced when the wood is cut from the inside of the letters, so that they print white. This is the easier method. In Fig. 2 the wood has been cut away from between the letters, giving black letters on a white background.

Use tracing paper or thin drawing paper, and carefully draw the design on to this, using a soft lead pencil. Make the framework first by pencilling round the block.

Shade the parts you wish to appear black in the print. Then turn the tracing paper face downwards on to the wood, and 'rub off' the design with a pencil. Be careful not to move the paper during this operation. When you remove the tracing paper there will be the design on the wood in reverse—as seen through a mirror.

Cutting

The next stage is to cut out the white parts of the block. Use a razor blade, cutting round the edges of the letters. For straight pieces, use a ruler, preferably a steel one. Be careful not to over-shoot the mark when cutting, as even the small cut made by a razor blade may show when printing takes place.

Now remove the wood from between the razor cuts. Any convenient tool will do for this—a narrow chisel, or even a sharp pen-knife. There is no need to cut very deeply, just go below the surface of the wood. When all the

cutting-out has been done, trim off the ragged edges with the razor blade.

The Printing

Now for the printing. Do not make the mistake of printing directly into a book. Make your prints on paper, then stick the paper, cut to size, inside the cover.

Experiment, if possible, with different types of paper in order to obtain the best results. Duplicator ink is very good, especially if used on a semi-absorbent paper. You are not restricted to black, of course, for inks can be obtained in various colours. Use a felt pad for inking the block, or alternatively,

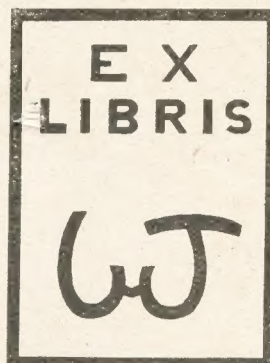


Fig. 2—With black lettering

brush the ink on, applying thinly and evenly.

The process of cutting the block is similar if lino is used, but this is easier to cut, and more complicated designs are possible. For convenience, the lino block should be glued or tacked to a piece of wood.

Now watch the difference a book-plate makes in bringing your precious books home to roost!

A Tripolar Motor—(Continued from page 21)

After the motor has been finished and operates satisfactorily, it will prove helpful to give all the windings a coating with varnish. When dry, this will hold all turns secure. For a 3 to 6 volt dry battery supply 26 S.W.G. wire is suitable. This is also satisfactory for a small transformer. If a 2 volt accumulator is used, then 24 S.W.G. wire will be more suitable.

Actually, the wire gauge may be varied within large limits, but the following points should be noted. For maximum power, a fairly heavy current must flow and thin wire cannot, therefore, be used. But if economy of operation is desirable and low power only is required, a thinner wire may be used, up to 32 S.W.G. proving suitable for 4 to 6 volts. Further economy may also be obtained by connecting the brushes and field in series, instead of in

parallel, as shown, but this reduces power in the same way as using thinner wires.

Obtaining Best Running

For the motor to run at its best, the brushes should make good contact with the commutator, but not press too hard. The commutator must be in a correct position relative to the armature poles

so that each pole receives an alteration in the direction of the current flowing from the brushes as the pole passes the ends of the field coil magnet.

The simplest way of assuring this is to stop the motor and turn the bush a few degrees at a time on the axle. When the correct position is found, the motor will run at maximum speed and no further adjustment is necessary.

For driving models a very small gear or pulley wheel should be used on the motor axle so that a fairly high reduction ratio is obtained. Without this the speed at which the motor runs will be reduced and in consequence it will not develop much power.

For battery operation a permanent horseshoe magnet may be substituted for the field magnet. The motor will not then work from a mains transformer, however.

Index for Vol. 109

Apart from being essential when you get your Hobbies Bound an Index is always useful for reference when you are wanting something to make or do. Volume 109 was completed with the last issue in March and an Index for the previous six months is available from the Editor for 1/- post free

A GAMES BOX

The reader will, naturally, wish to vary the arrangements to suit the games he favours, and this is quite a simple matter. The outfit illustrated provides playing board and compartment for draughtsmen or chessmen, for cards and trump indicator; a score pad and place for pencils, and a pegging board, and leaves plenty of space for holding darts, dice, and anything else the owner may wish to be taken care of.

The exact size is not important, so before deciding on the actual dimensions, it is best to consider what material is available and whether it is intended to incorporate a draughts board already in the reader's possession.

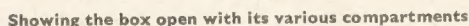
A technical perspective drawing of a rectangular wooden box. The overall length is 10 inches, width is 8 inches, and height is 4 inches. Inside, there are two vertical dividers creating three compartments. The left divider is 3 inches from the left wall and 3 1/4 inches from the bottom. The right divider is 4 1/2 inches from the right wall and 3 3/4 inches from the bottom. The bottom board has a central cutout between the dividers, measuring 2 1/2 inches wide and 2 1/4 inches deep. The top board is shown as a separate piece with a width of 3 inches and a depth of 4 1/2 inches.

Details of sizes and construction of main box portion

Construction

Glue or neatly screw together the four

While the lids are in this position, mark the exact places for all four partitions, then remove the lids and glue or screw the partitions into place. Doing the work in this order makes quite certain that the lids will fit nicely, no matter what thickness the wood happens to be. They rest on corner pieces each cut the thickness of the lid shorter than the width of the partitions. When in place the lids are thus just flush with the top of the partitions.



If a score pad of the right size is not available, a slightly larger one can be cut down with razor blade or sharp knife and a straight edge. The last page or backing card is glued to the top of the lid later on, when whatever finish chosen has been added.

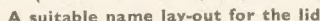
For the trump indicator the four suits can be either neatly painted on to the lid, or if (as usually happens), a few odd cards are around from some incomplete pack, the four designs can be cut from these and neatly glued into position. The pointer is made from a small strip of brass or other thin sheet metal, held into position with a small screw.

Four little knobs are screwed to the lids, to complete this part of the work. They need to be very short in height, in order not to prevent the lid from closing. Alternatively, four short pieces of dowelling, about $\frac{1}{4}$ in. diameter, glued into holes neatly bored with the brace, will do just as well. If the top of each piece is rounded off, this looks even neater than the bought knobs.

To make a folding draughts board, procure two pieces of stout cardboard and cut them to identical size, the length of each piece double the width. Lay them side by side with the long edges touching, and glue down this joint a piece of gummed paper or tape. When this is dry, fold up the cards book-wise and glue another strip over the back edges.

(for wood of $\frac{1}{4}$ in. thickness)

- 2 pieces 10ins. by 8ins. Lid and Bottom.
2 pieces 10ins. by 3ins. Sides.
2 pieces 7ins. by 3ins. Ends.
2 pieces 7ins. by 2ins. Partitions.
1 piece 3ins. by 2ins. Partition.
1 piece 4ins. by 2ins. Partition.
1 piece 4ins. by 3ins. Cards Box lid.
1 piece 3ins. by 3ins. Score Pad lid.
1 piece 4ins. by 4ins. Draughts Box lid.
1 piece 4ins. by 2ins. Pegging Board lid.
1 piece 8ins. by 6ins. Overlay.



It will be seen that one of the lids carries the pegging board, one the score pad, and one a trump indicator. The holes in the pegging board can be made with a drill, but the board should be drawn out first to ensure the holes being in straight lines. It is also a good

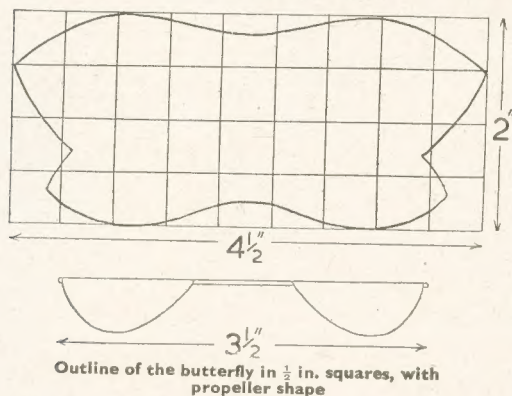
Amuse and entertain your friends with this BUTTERFLY NOVELTY

HERE is a timely little novelty for the youngsters—and, of course, the not so young—with which to cause a bit of harmless fun. If made correctly this 'demon butterfly' should rise to a height of several feet as soon as the harmless-looking folder is opened by the unsuspecting victim. Whether the desired effect will be achieved depends upon the thickness of paper used—the heavier the paper the shorter the distance the butterfly will rise.

Materials Needed

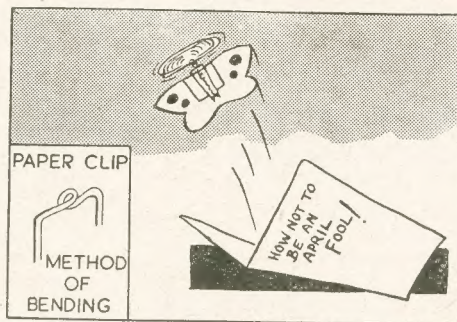
The only materials needed are an envelope of moderate thickness, a large-size paper-clip (or piece of wire just over 4ins. long), a small elastic band, two little beads, a sliver of wood and a few inches of fine wire. Where can you get the thin wire from? You will find two excellent strands inside any pipe-cleaner.

Begin by cutting out the wing shapes from the face of the envelope and place it near to hand. Take your paper-clip and straighten it out, removing the kinks with the aid of a small pair of pliers. This wire will be over 4ins. long. Mark it at the middle and twist the wire



completely round so that you have a small, circular loop in the middle of the wire. Press the loop flat and, with the pliers still gripping firmly, bend down the two ends of the wire to form a pair of shoulders (see detail illustration).

This may appear complicated before you try it but is really not as difficult as it



looks. To finish with the paper-clip (we may as well still call it one), just bend up the ends, taking in as little as possible. These will be necessary to hold the end of the elastic band firmly.

Fitting the Elastic

Take the elastic, a band that will fit loosely along the length of the wire braces, and loop it round the ends of the wire as can be seen in Fig. 2. Now press home the bent ends so the elastic is held in place firmly enough to resist the tension when it is wound up.

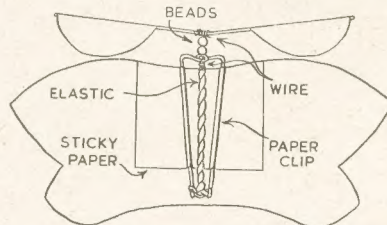
The next thing is to get the paper-clip fixed to the wings. This can be done with a piece of sticky-backed paper or with a touch of stronger glue. You will have to hold the elastic band out of your way—unfortunately the band has to be put on before the paper-clip is fixed, otherwise it would be a ticklish job.

Press the paper firmly down all round the wire and leave it until it is perfectly dry before working on it again. You can be removing the fine wire from the pipe cleaner while you are waiting.

Take your sliver of wood, pare it down as thin as you can, so it will be fairly pliable, and cut it to a length of $3\frac{1}{2}$ ins. This is for the airscrew shown in the bottom part of Fig. 1. Shape out the two pieces of paper to glue in place at the ends; get them fixed, winding them once around the stick for security.

Coming back to the wings. Take hold of the loose end of your elastic and wrap one end of the pipe cleaner wire around it. Pass the other end of the wire through the loop you made in the paper-clip. Slide the two beads down it so they rest on the loop. Now wrap the other end of your fine wire around the middle of the piece of wood, drawing all the parts together as you do so. Then break off the excess wire.

It will be noticed that the paper on the ends of the air-screw overlap the wings. The wood should be bent from the middle until these parts are clear. The wire binding will prevent the wood from breaking at this point. The butterfly is now complete but, in addition, it



Showing mechanism in position

could be decorated in either brightly painted colours or with pieces of coloured paper, cut in circles and stuck on to the wings.

How to Use

To put the joke into operation hold the wings in one hand and wind up the airscrew with one finger until the elastic is as taut as you can get it. It can be placed inside the cover of a book and left lying around the house, but if you wish it would be easy to hand it to somebody personally.

For this purpose you could prepare a stiff cardboard cover with some kind of a title written on the outside. As long as the cover is held shut it is impossible for the butterfly to jump out.

The card should be neatly folded in half and can be kept in the pocket with a rubber band around it.

Games Box—(Continued from page 23)

Now glue a sheet of stiff paper over each flat surface, and when dry, rule up one or both surfaces and paint black the alternate squares. You will need to divide the board into eight equal divisions in each direction, to leave two clear rows between the two sets of 12 draughtsmen when arranged at the start of the game.

The folded board is held on to the inner side of the lid of the box by

rebates of thin wood or cardboard. The simplest way of doing this is to build up each length with two pieces, the one $\frac{1}{2}$ in. wider than the other. Glue another piece at the end, in the opposite direction, to form a stop when the board is pushed in.

Finishing Off

The ruled design gives a simple suggestion for the lid, but the reader

with artistic ability can, of course, embellish this to suit himself. In fact he might prefer to paint the design on to the lid, which gives still further scope for suitable ornament.

Finally fix the lid to the box with two neat hinges, and a small fastener at the front, and finish off with stain, varnish or paint, according to preference and the wood used. See you have the whole thing clean, neat and attractive in appearance.

How to fix battery and electrical connections for ALARM CLOCK LIGHTING

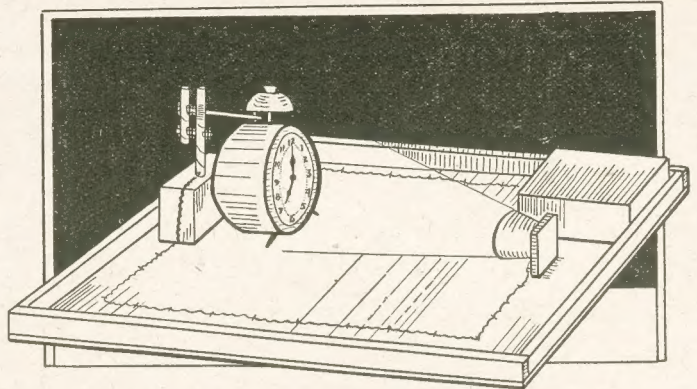
WHEN we have to be 'up in the morning early' most of us need to rely upon an alarm clock. And when its bell rouses us from our slumbers have you noticed how often we knock over the clock (and sometimes other things, too) in our sleepy fumbling to lay our hands on it in the dark?

The little electrical arrangement shown obviates all that, by automatically lighting up the clock when the alarm goes off. It can be adapted to all the usual types of clockwork alarm, and needs only a torch battery and bulb, some small pieces of wood, and one or two of the screws and pieces of wire that every handyman has amongst his oddments, or can procure easily for a few pence.

Method of Mechanism

Alarm clocks are all very similar in principle but differ widely in their actual design. For this reason no actual measurements are given. But the method of fixing up the light is clearly shown and the reader with an electrical turn of mind will have no difficulty in making each piece to suit his particular clock.

Briefly, the electrical contact breaker is so arranged that the circuit is closed by the first forward movement of the striker when the clock starts to ring. It stays closed whilst we open our eyes, perceive the time by the illuminated clock face, and switch off the alarm and



fixed and one movable. Bore the block about $\frac{1}{2}$ in. deep to take the fixed dowel. The movable piece is held to the other by a nut and bolt, with washer between the two dowels as shown.

At the top end of the movable piece drill a hole to take a brass screw about $2\frac{1}{2}$ ins. long which, when in position, will project up to the striker on the alarm clock. The wiring of the circuit runs up these two dowels, and is closed when the brass screw is pushed forward to touch the bared wire on the fixed dowel.

A little careful adjusting of the bolt

the bell, and is close up to the striker. In some cases the bell on the clock has to be wound back a little higher, to give more space between bell and clock case.

Whatever kind of clock is used, it must be held firmly in the tray, so it does not move when the alarm rings. If the clock has legs, these can fit into holes drilled for them in the baseboard. A square or rectangular clock can be held in place by neat strips screwed to the base.

Inside Bells

Clocks that have the striker inside the clock need a little different treatment. The principle is usually the same—a little gong striking either on to the inside of the case or (if this is of wood or bakelite) on to a little bell or strip of metal put in for that purpose. Since this type of clock needs a small hole to be drilled in the side of the case, it is best to allow the clock to run down before commencing operations.

Then take the movement out of the case if this can be done easily. If not, drill the required hole from a sideways position, so the drillings do not fall into the 'works'. Take

care also not to let the bit slip right in, but pull up as soon as it is through the case. Choose the position for this hole carefully, as near to the striker as can be arranged.

Usually, less cutting of the case is necessary if an 'end on' push is adopted. Fig. 3 shows such an arrangement. In this case the contact maker will, of course, stand beside the clock, and not behind it as in the method shown for clocks with outside bells. Then only one small hole is needed in the clock-case, through which a short piece of dowel, of the same diameter as the hole, will slide.

This dowel is pushed outwards slightly by the striker, when it moves forward towards the side of the case or

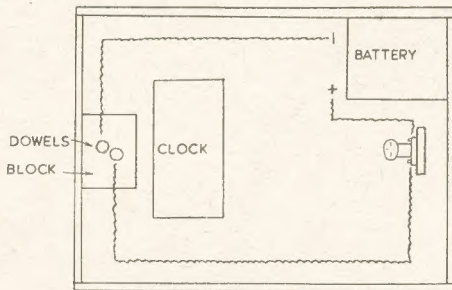


Fig. 1—Lay-out of board and wiring

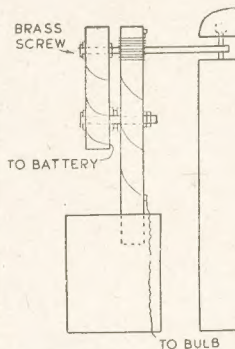


Fig. 2—Contact for outside bell

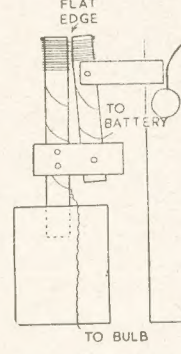


Fig. 3—Contact for inside bell

the light. The clock, light and battery are all held in a small tray, as shown at Fig. 1, though the clock can be lifted out for use independently whenever it is so required.

For the base itself, a small board or piece of plywood is needed, with narrow strips to make it into a tray if desired, although these are not essential. The only other wood required are some small pieces for the battery case, a block to stand behind the clock, and a foot or so of dowelling.

The Contact Makers

The drawing at Fig. 2 shows the general principle for clocks with an outside bell. The contact maker consists of two pieces of dowelling, one

that holds these two dowels together is necessary, so the movable piece is loose enough to move forward and touch the other when pushed by the striker, but tight enough to stay in that position until the light is required to be switched off. Later on, when the final touches have been added, put a second nut on the bolt and lock it down on to the first after the exact degree of tightness has been obtained. This will prevent the first nut from working looser with the to and fro movement of the dowel.

Fix Firmly

Get the exact height of the brass screw by varying the depth that the fixed dowel enters the block. It should be such that the screw projects under

bell. The other end of the dowel fits loosely to a second dowel, and from there the arrangement is very similar to the outside-bell method, except that both parts of the contact maker consist of wire-covered dowel.

It will also be noted that the two vertical dowels are not bolted together but are both held to a small piece of plywood near the block. The fixed dowel has two screws through it, and the movable piece one. Here again the joints need to be loose enough to allow of movement but tight enough to hold the electrical contact as long as is required.

Before wiring the movable vertical dowel, flatten one edge a little as shown, so that a broader surface is given for the bared wires to meet. The little dowel that projects through the side of the

clock case needs to work smoothly, and it usually means bending the striker a little to arrange that it touches this dowel when it moves forward.

The Light

Screw a bulb holder to a small piece of wood, and fix the wood in a vertical position into the base board, as shown. Make a little hood for the bulb, to direct the light on to the clock, of thin sheet metal, paper or cardboard, and fix it to the lamp base with screws or gummed paper as most convenient. Three small pieces of wood make a vase for the battery, screwed to the base board from underneath.

Wiring is quite simple and is shown at Fig. 1. The most important place is at the top of each dowel, where contact is

made. When the wire itself is to make the contacting surface, bare it for a few inches, fix the end with a small screw into the dowel, then wind the wire round the dowel, each strand touching the next for about $\frac{1}{2}$ in.

This makes a good broad surface for the contact, and after that the wire can be left covered and simply twisted round the remainder of the dowel in any way most convenient. A small screw at the point where the wire leaves the dowel prevents the wire from moving.

When all is ready, a trial with the clock can be made, and little adjustments in the position and movement of the contact-makers attended to. Then finish off with stain, paint or enamel, to match the clock that is going to be used with it.

Some suggestions of countryside code and manners in HINTS FOR HIKERS

MANY of our readers this Spring may be taking up the grand outdoor pastime of hiking, or rambling if you prefer it. We have heard it said that 'A little of the countryside goes to the head of the city youth', who is intoxicated, as it were, by the changed surroundings and the freedom of the open air.

Whilst this may be true, it is only the few hooligan-minded folk who behave foolishly when hiking, and the great majority are well-behaved and sensible. If you are a beginner, take your cue from them. You can learn a lot by joining a ramblers' club, and going along with the experienced ones.

Courtesy by All

Perhaps it is needless to thrust lessons in deportment upon the common-sense hiker. But, perhaps, it is not irrelevant to point out that there is a sort of 'countryside code' which new-comers should follow. Lack of good manners and boorishness are to be deplored at all times.

Country dwellers usually welcome hikers who come out to enjoy the open air, and it is only right that we should extend to them courtesy and consideration. Do not regard the countryman from the point of view of the cartoonist—as an ignoramus chewing a straw whilst lolling over the pig-sty door.

He is intelligent enough, we can assure you, and in these days especially is as wideawake as any townsman. So give him credit for that, and treat him accordingly. Then you will get on fine with him.

Farmers have complained quite a lot about the thoughtlessness of hikers who ignore the 'Please shut this gate' notice. Do not add to the number of the thoughtless. Leaving a gate open or unfastened is almost a crime in the country, for cattle, sheep and horses are apt to stray, or to enter a field and

damage crops growing there. Frequently trouble is caused by animals straying on to the roads, and taking the farmer's valuable time in rounding them up.

Good Manners

Good manners cost nothing. Rowdy parties invading a quiet country village on a Sunday especially are not looked upon as being a blessing. Rural folk resent such ill manners; there is just a minority who forget themselves.

Here are a few unwritten 'laws' that the beginner should conform to when rambling.

Keep to the footpath when crossing a field, especially where crops are growing. Avoid trampling in mowing grass.

Do not invade private grounds. Do not enter woods or coverts unless there are public rights of way. Where woods and country parklands are kindly thrown open to the public, be thoughtful and leave no litter behind if you pause there for a haversack lunch. Do no damage to trees or shrubs.

If you have occasion to light a fire to boil a kettle for making a cup of tea on moor or heath—or other spot, for that matter—make sure that the embers are thoroughly stamped out before proceeding on your way.

Do not throw away cigarette ends that are still alight; stub them out with your finger and thumb. Do not drop a lighted match into the grass, heather, or undergrowth.

Litter Fiends

Alas! Litter fiends are still with us.

**Be sure to read
our advertisement
pages for some
practical offers**

Not always is it the hiker who transgresses; motorists on country roads are not blameless. Do not copy their example.

The litter fiend is often just thoughtless. He—or she—just dumps a cigarette carton or a bit of sandwich wrapping paper by the wayside, and thinks it matters not at all. Well, it does. Who wants to see the countryside disfigured with such stuff? It is as easy to put it in your haversack and carry it home to burn it, as it was to bring it along.

The outdoor picnic is always an enjoyable meal. When you have finished, collect all paper bags, wrappings, empty tins, and scraps left over, and either take the litter away with you, or destroy it in some way. Put a match to that which will burn, but do not set the hedgerow or bracken on fire, and make sure no embers are left to smoulder. Or you can push it down a rabbit burrow or similar place where it cannot blow about.

No River Pollution

Get rid of your litter in some way, but do not dump it in a stream. For, though even many country people seem to regard any brook or river as a convenient dumping place for rubbish, set them a better example.

Remember, farmers and others living on the banks may have to depend upon the water for use. Besides, who likes to see a clear stream littered with sardine tins, rotting cartons, paper and other rubbish?

Wherever you go on your hikes, stick to a code of good manners and correct behaviour. Think at it like this—'I should resent people coming into my garden or yard and upsetting my flowers and making a mess of the place. Therefore, I will not be like that when in the country, but will be as considerate when walking across fields, through farmyards, in the woods, and by the stream, as if it were my own property!' Thoughtless and ill-behaved hikers only get a bad name for hikers in general.

You can make many delightful and useful things in LEATHERWORK

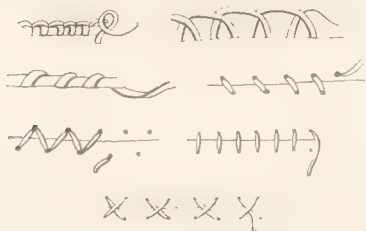
LEATHERWORK does not only mean the modelling of a picture on leather, but entails the making up of an article in the manner suitable to the material. The most important thing to remember is that the article should be of good workmanship and should serve the purpose for which it is intended. Great care should be taken to see that the corners are square and that the edges are straight or a bag, or other article will not close properly, and the gussets or pockets will not fit the main piece of leather.

Always plan an article in paper, cutting out the pieces to see they fit one another. The pattern can then be placed on the leather, drawn round with the tracer and the lines cut against a ruler. If the pieces are ready cut it is always as well to see that they are square before making the article as in wholesale cutting, the work is sometimes careless.

Matters of Design

When selecting a design care should be taken that it is the right size for the space to be filled, allowing for at least $\frac{1}{4}$ in. for the thong edge around the article. Measure carefully to see the design is straight or exactly in the middle if it is intended to be so.

Always work on a clean piece of paper and keep the leather wrapped up when not in use. Have clean hands, as grease marks are not easily removed and those places will not take stain. A small piece of paper can be placed under the hand whilst modelling. Wet the leather all over the first time as the colour will change—subsequently it is only necessary to damp the piece to be worked on. Leather must be kept damp but not really wet or it will stretch badly and never regain its normal size, leaving puckers in the surface.



Some examples of thonging

Good craftsmanship means considering the nature of the material and working in a manner suitable to that medium. Leather is strong and meant for hard and long wear. It is, therefore, sensible to use leather thongs for joining the pieces and strengthening the edges rather than to machine these with cotton which will wear out long before the leather.

The same thing applies to lining. Many people line bags or other articles with silk or cotton material. This is quite

suitable in the machine-made article such as a bag made in very thin leather which will generally only last for a few months wear. But the leather used in this work is heavier and with a thin leather lining and thonging for joining the pieces, it will last for years.

When a lining is used, cut out the two pieces, paste them together with flour paste and leave under a flat surface to dry before using. If stiffening is used, such as cardboard for a photo frame or writing case cover this should be cut smaller than the leather to allow for thonging, and pasted to the leather and allowed to dry under pressure.

It is as well to write down the order of procedure if working for the first time, so some important point is not forgotten. If the work is started from the cutting stage, work as follows. Plan the article in paper; cut to pattern; sew pockets to lining or pieces together to form pockets; trace on and model design; measure for punching; punch holes; stain leather, stain leather for thong-cut thongs; polish the pieces; and finally make up the article.

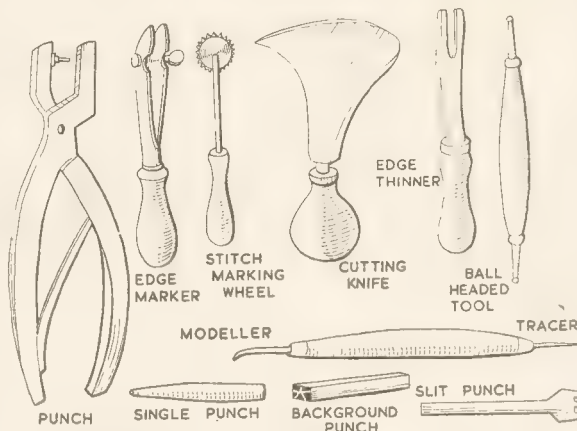
Stuff the article with a wad of paper when giving the final polish, or sometimes inner pockets or purses will leave a mark from the pressure made from polishing. If press studs are not available, it is as well to plan some other means of fastening, such as a tongue through a slot or a band across a flap.

Tools You Need

Tools needed for leatherwork are shown in the drawing and detailed as follows. Tracer: a pointed instrument for pressing a design through paper on to the leather which has been previously damped. Modeller: a flat, round-headed tool for pressing down the leather round or on the design. Ball-head tool: for raising the leather by pushing up from the back to throw parts of the design in higher relief. Edge tool: dividers for making lines at the edge of leather or for measuring punch holes. Edge thinner: a narrow blade for paring the edges if two or more are to be sewn or thonged together. One edge of the tool rests on the table and the other on the leather edge. Thinning knife: a sharp blade for thinning the inside of leather where a fold is needed. The knife is held rather flat against the surface and pushed with sharp strokes forward. If a ruck occurs, the paring

must be done from the opposite direction. Practise is needed in this operation, as it is very easy to cut right through the leather. Stitch marker: a wheel with points for marking holes along a ruled line for stitching.

Punch: a spring punch to be used by pressure in the hands. Extra heads are available of different sizes, but an



A selection of the tools necessary to the leatherwork

eight-hole wheel punch is best for the work and quicker. Slit punch: flat three-pronged blades for making slits instead of holes to be used by hammering through the leather. This method is more difficult but neater than the round hole thonging. Background punches are stamps in various sizes for decorating borders or the backgrounds of geometrical designs. Awl, Ruler, Set-square: all these tools can be substituted by home-made gadgets. Excellent work has been done with a large nail file, filed off flat or a knitting needle for a modeller. A very successful slit punch was made from a nail filed to a sharp flat edge, while background stamps have been made from screws with a design filed out on the head and the screw end put into a wooden handle.

Tracing

Select a design that suits and fits the piece of leather to be decorated. Damp the leather and place the paper over it and with the tracer press over the lines in the same way as a drawing on tracing paper. Keep the lines as unbroken as possible. Do not press too hard or the paper will tear off and the surface of the leather will be cut.

Redamp the leather and with the modeller press down the leather round the design. The tool should be held like a pencil with the side of the blade against the line of the design. Steady the tool by putting the first finger of the other hand against the handle. This will also prevent the finger nails from digging

into the leather if the other hand is left free.

Take long sweeping strokes from right to left and if the leather puckers repeat in the opposite direction. Do not take the strokes too far away from the outside of the design or press so hard that the surface becomes bruised or shiny or it will not take a stain easily or evenly. The design can be well raised in this manner and those with drawing ability will be able to add lines to give the design more character. To throw up some parts into higher relief, such as the petal of a flower, the ball-headed tool is used.

Relief Work

Damp the leather and rest it on the table. With the tool held straight, gently press up the leather from the back with circular movements under the parts that need more rounding. Do not overdo this pressing, as high-relief is not in very good taste and is likely to stretch the leather so much that it will need padding at the back to keep it from denting in again. It will be necessary to go round the design with the modeller again as the lines will be pushed out by the ball-headed tool.

To make the design stand out more clearly the background can be matted with the tracer by damping the leather and making dots all round the design. Gradually fill in the space to the edges or

only to a certain distance round the design. The matting will also cover a badly bruised background.

Geometrical Patterns

For those who do not wish to make a pictorial design, a very good effect and one suitable to leather can be produced by simple line borders or criss-cross in diamonds or squares over a cover. This should be planned on paper first and the guiding points pressed through before the lines are ruled.

The background punches can be used at the intersecting points of these lines or evenly in the squares to make a repeat pattern. This tool should be used with a hammer. The leather can also be decorated in a simple pattern all over by crosses or scales if care is taken that the marks are even and of the same size.

Hand Sewing

For pockets and purses and for extra tongues for fastening, a hand-made stitch with wax thread is more satisfactory than machining. Mark the hole along a line with a stitch-marking wheel. Prick holes right through these marks with the awl. Grip the pieces between the knees.

Thread two needles on one piece of waxed cotton and push one through the first hole and pull the cotton until half lies on either side. Insert needle No. 1,

in the second hole and pull until half the cotton is through, catch the loop made on the little finger. Push needle No. 2 through the second hole and when the same amount of cotton is through to the other side, let go the loop of the first and pull with both hands evenly. This ensures even stitches. If pockets are to be sewn together, the first stitch must go over the edge and in through the first hole again.

Staining and Painting

Fast dyes are used for staining articles made in leather. The dyes should be mixed with cold water: about one teaspoonful of dye to one pint of water. If a strong solution is mixed it can be kept in a large bottle and diluted when necessary. The dye must be well stirred so every grain is dissolved before using. These colours can be mixed if the pure colour is not suitable. Always mix enough dye to stain all the pieces of an article as it is not always easy to get the same depth of colour the second time.

Damp the leather all over, and with a piece of waste or cotton wool dipped in the stain, rub over the leather with circular movements, starting from the top corner. Work quickly and press evenly, as the harder the pressure, the darker the stain becomes. If the first coat has not produced the desired effect, repeat all over before the leather dries.

(To be Continued)

Scale Patterns for OO or O Gauge Signal Box

(See opposite page)



A scale diagram is given on opposite page for this MODEL SIGNAL BOX

THERE are many methods of building a signal box in OO scale, of which probably the simplest is that using cardboard, which is folded and glued together as already described in an article which appeared in HOBBIES WEEKLY for December 15th, 1948. But when construction is undertaken in O gauge, this material is far too frail, and wood must be used.

For OO Gauge

The making of a signal cabin in wood involves a fair amount of skill, if it is to be used for housing the levers, and it is essential that the structure is at once neat and strong. The main structural difficulties are created by the large amount of glazed surfaces, and the smallness of the window mullions.

The scale diagram shows a normal representative of the combined brick and timber structures used by many railways and will house a frame of about nine levers. The diagram is reproduced full-size for OO scale, but for O gauge construction, each measurement must be divided by four and multiplied by seven; the ratio between the two scales being as four is to seven.

To get the lever-frame into the building, it is necessary that some portion is removable or hinged. Or again, the lower brickwork portion may be made up complete with the lever-frame and screwed to the model railway baseboard. The latter scheme is a very convenient one for making and fitting the levers. Some readers may, however, feel that the rather unreal spectacle of lifting off the upper portion of the box every time a lever has to be worked, is a disadvantage.

Removable Back Wall

Another idea is that of making the back wall of the box either hinged or entirely detachable, or completely absent. Yet another method is that of making the entire building separate from the lever-frame, building it to drop into place over the latter after all the connections to the points and signals have been made.

As this last method of construction enables the operator to get at the levers without the necessity of weakening the structure, the model to be described will be built along these lines.

It will be appreciated that a prototype cabin is a two-story building, of which the upper story is occupied by the levers and the lower by the locking gear and other paraphernalia. In our model, however, the lever-frame is screwed to the railway baseboard which is in effect the ground floor. Its levers—being greatly over-scale—project through the floor of the upper story. Therefore, this floor must have a

rectangle cut in its centre to accommodate the lever-frame.

The upper floor is placed at the same level as that of the outside stair landing, and it may be either fixed to the frame or—for strength—to the cabin walls; the latter being made from $\frac{1}{8}$ in. stuff.

It is a matter for individual taste whether the sides and ends of the structure are bevelled at each end to produce an invisible joint at each corner. Or whether the sides are made longer by twice the thickness of the wood used, and glued and pinned direct to the ends. The latter method, though much easier, shows a joint at each corner when the model is viewed from either end, but this is of no importance if the box is being covered with brick-paper.

The front wall should be cut out to the inclusive size of all three window-sashes. It should have rebated pieces of $\frac{1}{4}$ in. square wood glued along its whole length above and below the line of windows to retain the glass in place behind the opening. In this respect it is important that the glass must be left free to move in the slots, otherwise it will soon crack.

Door Opening

The end wall of the building in which the window and door are shown, is treated in exactly the same way as the front wall. An extra hole is cut for the door, behind which a piece of $\frac{1}{8}$ in. wood may be glued after being scribed with a knitting-needle vertically to represent the matchboarding of a plain 'ledged' door. Alternatively, the door may be cut from card or $\frac{1}{32}$ in. plywood and glazed in its two upper panels.

On some signal boxes, access to the locking-frame is by means of a trap-door in the upper floor. If desired, however, another door through the end wall may be made below and to the right of the upstairs door, thereby giving apparent access to the ground floor.

Roof Fitting

The roof is made from $\frac{1}{8}$ in. wood, being rebated at the gable at each end to take the ornaments, and having the weather-boards fitted under its ends, slightly back from each edge. It is a good plan to bevel off the edges of the roof boards, so the roof does not appear too thick where it can be seen. More model buildings are ruined in appearance



A guide for building and painting the model

through over-scale thickness of roofs than, perhaps, by any other error.

The front portion of the roof and its ridge should be fixed to the walls, but the back portion, together with the upper part of the chimney should be made removable. Blocks are glued inside the roof at its edges to prevent its slipping down. The lower part of the chimney can be glued inside the back wall if desired.

As the sashes and lights of the window are too small to be cut in wood, they may be painted on the back of the glass or cut out in thin white Bristol-board and stuck on the latter.

A plinth of stripwood should be glued all round the base of the cabin, and another strip at the upper floor level to represent a 'string-course'. A further strip of slightly thicker material will serve as a sill along the front side and door end walls.

As to the stairway, this is made up from stripwood and may be placed on either side of the box, the door being transposed to suit.

Painting the Model

As to the type of finish for the signal box. It may be matt painted a brick-red up to the stringing course. Above that that point is green, with the sashes picked out in cream; or brickpaper—either blue or red brick—pasted below the stringer course and paint above.

If brickpaper is not being used, it will be found advantageous to scribe brickwork on the walls before they are assembled or glazed. A blunt knitting-needle is used for the purpose in preference to a knife edge, which merely cuts a line, rather than making a depression in the wood.

The hand-rail round the front wall and half-end wall is made from a piece of No. 18 S.W.G. wire, being painted black; as, incidentally, is the chimney above the roof.

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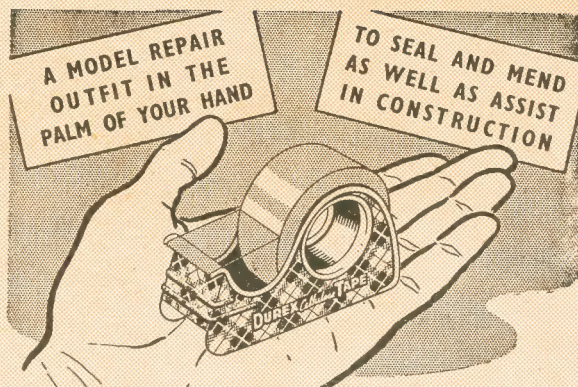
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